

**ARIZONA GAME AND FISH DEPARTMENT
HERITAGE DATA MANAGEMENT SYSTEM**

Animal Abstract

Element Code: AABH01210

Data Sensitivity: No

CLASSIFICATION, NOMENCLATURE, DESCRIPTION, RANGE

NAME: *Rana tarahumarae*
COMMON NAME: Tarahumara Frog, Mexican Frog
SYNONYMS:
FAMILY: Anura: Ranidae

AUTHOR, PLACE OF PUBLICATION: Boulenger, 1917. Ann. & Mag. Nat. Hist. (ser. 8) 20(120): 413-418.

TYPE LOCALITY: Ioquivo (=Yoquivo) and Barranca del Cobre, Sierra Tarahumaré, Chihuahua, Mexico, restricted by Smith and Taylor (1950) to Yoquivo, Chihuahua, Mexico (see Zweifel 1968, Frost 1985).

TYPE SPECIMEN: Syntypes: British Museum Nat. Hist. 1947, 2.28.76-79 (formerly 1911.12.1236-39) from Ioquiro and 1947.2.1.63-64 (formerly 1914.1.28.148-149 from Barranca del Cobre).

TAXONOMIC UNIQUENESS: Monotypic species in the *Rana tarahumara* group (Webb 1978, Hale and May 1983). Zweifel (1968) suggested that *R. tarahumarae* was part of the poorly understood *Rana boylei* group, with *R. pustulosa* being the closest relative, however further evaluation of specimens revealed that it was not a part of the *R. boylei* group.

DESCRIPTION: Adults range in size from 5.8-11.4 cm (2.3-4.5 in) snout-vent length, and females are larger than males. Their skin is pustulose. Dorsal coloration is drab green to brown with small dark spots. The legs have dark crossbars. The ventral surface is white, yet the throat and chest may have gray melanophores arranged in no definite pattern. Yellow may be present in the groin. The hind feet are webbed to the toe tips, and toe tips are slightly expanded (Wright and Wright 1949, Stebbins 1951, Zweifel 1968, Hale and May 1983).

Larvae may grow as large as 9.7 cm (3.8 in) before metamorphosis. Their coloration is greenish-yellow with small, dark spots on the body and large dark spots on the tail (Wright and Wright 1949, Stebbins 1951, Zweifel 1968, Hale and May 1983).

AIDS TO IDENTIFICATION: The dark banding on hind legs, indistinct dorsolateral folds, indistinct granular eardrum, and lack of light jaw stripe aid in identification (Zweifel 1968, Stebbins 1985).

ILLUSTRATIONS: Black and white photos (Wright and Wright 1949: plate CXXII)
Black and white drawing (Stebbins 1966: plate 11)
Color photo (Behler and King 1979: plate 193)
Black and white drawing (Stebbins 1985: plate 13)

TOTAL RANGE: Extreme south-central Arizona in the United States (extirpated in early 1980s) and parts of north-central and eastern Sonora, western Chihuahua, and northeastern Sinaloa in Mexico (Zweifel 1968, Hale and May 1983).

RANGE WITHIN ARIZONA: Before its extirpation from the state in the early 1980s, *R. tarahumarae* was found in three drainages in the Santa Rita Mountains and three drainages in the Pajarito-Atascosa-Tumacacori mountains complex in Santa Cruz County.

SPECIES BIOLOGY AND POPULATION TRENDS

BIOLOGY: Adults spend most of their time around permanent sources of water and plunge pools. In the cool, dry winter months, frogs retreat to hibernacula. They emerge in the spring when water temperatures reach about 10 EC (50 EF) (Hale and May 1983). Most movement occurs during the summer monsoon and is linear along streams with little overland dispersal (Zweifel 1955, Hale and May 1983). Males and juveniles have been reported to move up to 1885 m (6,184 ft) and females up to 651 m (2,136 ft) (Hale and May 1983). *R. tarahumarae* can live at least six years (Hale and May 1983).

REPRODUCTION: Breeding activities in Arizona were reported primarily from April to May, but may have occurred in summer months as well (Zweifel 1955, Hale and May 1983). The mean number of eggs in egg masses from Arizona frogs was 1084 (standard error = 161, n = 7) and larvae in the wild take up to two years to metamorphose (Hale and May 1983).

FOOD HABITS: Tarahumara frogs are general predators and will eat almost any animal that can be swallowed. Both diurnal and nocturnal feeding is evident based on the array of food in stomachs. Prey items include juvenile Sonoran mud turtles (*Kinosternon sonoriense*), Sonora chub (*Gila ditaenia*), black head snakes (*Tantilla atriceps*), beetles (Tenebrionidae and Scarabaeidae), water bugs (Belostomatidae), sphinx moths (Sphingidae), scorpions (Scorpionida), centipedes (Chilopoda), grasshoppers (Agrididae), mantids (Mantidae), wasps (Hymenoptera), spiders (Lycosidae), crickets (Gryllidae), caddisflies (Tricoptera), and katydids (Tettigoniidae) (Zweifel 1955, Hale and May 1983).

HABITAT: In Arizona, *R. tarahumarae* prefer boulder-strewn perennial streams and seasonal streams with bedrock beds that include deep, drought resistant plunge pools. Stream flows average less than 1.4 cubic meters (370 gallons) per second. Large streams may be avoided because of their propensity to flood and their variable flow rates (Hale and May 1983).

ELEVATION: Elevations of localities range from 460 m (1,500 ft) to over 1860 m (6,100 ft) (Stebbins 1985). Localities in Arizona range from 1068 - 1891 m (3,500 - 6,200 ft).

PLANT COMMUNITY: In Arizona, *R. tarahumarae* occupied habitats in semidesert grassland and Madrean evergreen woodland plant communities (Zweifel 1955, Hale and May 1983).

POPULATION TRENDS: No Tarahumara frogs, larvae, or eggs have been seen in Arizona since May 1983 (Hale and May 1983, Hale and Jarchow 1988, Hale 1992, Sredl et al. 1997, Arizona Game and Fish Department unpublished data). In northern Sonora, at least four of nine populations have been extirpated (Hale and Jarchow 1988, Hale et al. 1998).

SPECIES PROTECTION AND CONSERVATION

| | |
|---------------------------------------|---|
| ENDANGERED SPECIES ACT STATUS: | None (USDI, FWS 1996) [C2 USDI, FWS 1994] [C1 USDI, FWS 1991] [C1 USDI, FWS 1989] [C1 USDI, FWS 1985] |
| STATE STATUS: | WC (AGFD, WSCA 1996 in prep.) [State Endangered AGFD, TNW 1988] |
| OTHER STATUS: | None (USDA, FS Region 3 1999) [Forest Service Sensitive USDA, FS Region 3 1988] |

MANAGEMENT FACTORS: The Arizona Game and Fish Department is considering re-establishment.

PROTECTIVE MEASURES TAKEN: Arizona Game and Fish Commission Order 41 prohibits the collection of *R. tarahumarae* from the wild in Arizona.

SUGGESTED PROJECTS: If Tarahumara frogs are translocated into Arizona, the translocation itself should be executed as experimental. Survival, reproduction, and movements should be studied. Causes of the original extirpation are also important to reveal. These studies could include factors such as disease and toxins.

LAND MANAGEMENT/OWNERSHIP: USFS.

SOURCES OF FURTHER INFORMATION

LITERATURE CITATIONS:

- Arizona Game and Fish Department. 1988. Threatened Native Wildlife in Arizona. p. 9.
- Arizona Game and Fish Department. 1996 in prep. Wildlife of Special Concern in Arizona. p. 20.
- Behler, J.L. and F.W. King. 1979. The Audubon society field guide to North American reptiles and amphibians. Alfred A. Knopf, New York. p. 381.
- Boulenger, G.A. 1917. Descriptions of new frogs of the genus *Rana*. Ann. Mag. Nat. Hist. (ser. 8) 20(120):413-418.
- Frost, D.R. (Ed.). 1985. Amphibian Species of the world: a taxonomic and geographic reference. Allen Press Inc. and The Association of Systematics Collections. Lawrence, Kansas.
- Hale, S.F. 1992. A survey of historical and potential habitat for the Tarahumarae frog (*Rana tarahumarae*) in Arizona. Report to Arizona Game and Fish Department, Phoenix, Arizona and Coronado National Forest, Tucson, Arizona.
- Hale, S.F., G.M. Ferguson, P.A. Holm, and E.B. Wirt. 1998. Re-survey of selected Tarahumara frog (*Rana tarahumarae*) localities in northern Sonora, Mexico, in May 1998. Report to The Arizona Zoological Society and The Tarahumara Frog Conservation Team.
- Hale, S.F. and J.L. Jarchow. 1988. The status of the Tarahumara frog (*Rana tarahumarae*) in the United States and Mexico: Part II. Unpublished report prepared for the Arizona Game and Fish Department and Region II, Office of Endangered Species, USFWS, Albuquerque, New Mexico.
- Hale, S.F. and C.J. May. 1983. Status report for *Rana tarahumarae* Boulenger. Unpublished report prepared for: Office of Endangered Species, U.S. Fish and Wildlife Service, Albuquerque, New Mexico.
- Hale, S.F., F. Retes and T.R. Van Devender. 1977. New population of *Rana tarahumarae* (Tarahumara frog) in Arizona. Journal of the Arizona Academy of Sciences. 11(3):134-135.
- Sredl, M.J., J.M. Howland, J.E. Wallace, and L.S. Saylor. 1997. Status and Distribution of Arizona's native ranid frog. Pp. 37-39 in M.J. Sredl, Ed. Ranid Frog Conservation and Management. Nongame and Endangered Wildlife Program Technical Report 121. Arizona Game and Fish Department, Phoenix, Arizona.
- Stebbins, R.C. 1951. *Rana tarahumarae*. Amphibians of western North America. University of California Press. Berkeley and Los Angeles, California. pp. 382-387.
- Stebbins, R.C. 1966. A field guide to western reptiles and amphibians. Houghton Mifflin Company.
- Stebbins, R.C. 1985. A field guide to western reptiles and amphibians. Second edition, revised. Houghton Mifflin Company, Boston, Massachusetts p. 87.
- USDA, Forest Service Region 3. 1988. Regional Forester's Sensitive Species List.
- USDA, Forest Service Region 3. 1999. Regional Forester's Sensitive Species List.
- USDI, Fish and Wildlife Service. 1985. Endangered and Threatened Wildlife and Plants; Review of Vertebrate Wildlife. Notice of Review. Federal Register 50(181):37962.
- USDI, Fish and Wildlife Service. 1989. Endangered and Threatened Wildlife and Plants; Animal Notice of Review. Federal Register 54(4):558.
- USDI, Fish and Wildlife Service. 1991. Endangered and Threatened Wildlife and Plants; Animal Candidate Review for Listing as Endangered or Threatened Species; Proposed Rule. Federal Register 56(225):58814.
- USDI, Fish and Wildlife Service. 1994. Endangered and Threatened Wildlife and Plants; Animal Candidate Review for Listing as Endangered or Threatened Species; Proposed Rule. Federal Register 59(219):58996.

- USDI, Fish and Wildlife Service. 1996. Endangered and Threatened Wildlife and Plants: Review of Plant and Animal Taxa that are Candidates for Listing as Endangered or Threatened Species; Notice of Review; Proposed Rule. Federal Register 61(40):7596-7613.
- Webb, R.G. 1978. A systematic review of the Mexican frog *Rana sierramadrensis*. Contributions to Science Los Angeles County Museum of Natural History 300:1-13.
- Wright, A.H. and A.A. Wright. 1949. *Rana tarahumarae*. Handbook of frogs and toads of the United States and Canada. Comstock Publishing Associates. Ithaca, New York. 1949:553-555.
- Zweifel, R.G. 1955. Ecology, distribution, and systematics of frogs of the *Rana boylei* group. University of California Publications in Zoology 54:207-292.
- Zweifel, R.G. 1968. *Rana tarahumarae* Amphibia: Salientia: Catalogue of American amphibians and reptiles. 66.1-66.2.

MAJOR KNOWLEDGEABLE INDIVIDUALS:

- C.H. Lowe - University of Arizona, Tucson, Arizona
C.R. Schwalbe - University of Arizona, Tucson, Arizona
S.F. Hale - Tucson, Arizona
T.R. Van Devender - Arizona-Sonoran Desert Museum, Tucson, Arizona
R.G. Zweifel - American Museum of Natural History, Portal, Arizona

ADDITIONAL INFORMATION:

As of the last revision of this abstract, the Department (Arizona Game and Fish) was on step eight (Re-establishment proposal) of the 12-step Re-establishment Procedure.

Revised: 1991-02-19 (NML)
1993-02-21 (DBI)
1995-07-18 (MJS)
1997-12-24 (SMS)
2001-04-16 (KJF)

To the user of this abstract: you may use the entire abstract or any part of it. We do request, however, that if you make use of this abstract in plans, reports, publications, etc. that you credit the Arizona Game and Fish Department. Please use the following citation:

Arizona Game and Fish Department. 2001. *Rana tarahumarae*. Unpublished abstract compiled and edited by the Heritage Data Management System, Arizona Game and Fish Department, Phoenix, AZ. 4 pp.